

TRANSLATION of related part of Form PCT/ISA/237

WRITTEN OPINION OF THE ISA

International application No.
PCT/JP2004/019060

I. Basis of the opinion

1. This opinion has been drawn on the basis of the language of international application, unless otherwise indicated below.

OMISSION(2, 3, and 4)

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10/584077
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V Reasoned statement under Rule 43.2.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. STATEMENT

Novelty (N)	Claims 3, 4, 6-19, 25	YES
	Claims 1, 2, 5, 20-24	NO
Inventive Step(IS)	Claims 3, 4	YES
	Claims 1, 2, 5-25	NO
Industrial Applicability (IA)	Claims 1-25	YES
	Claims NONE	NO

2. CITATIONS AND EXPLANATIONS

Document 1: JP 09-260763 A
Document 2: US 5343487 A1
Document 3: JP 11-233889 A
Document 4: JP 2001-502119 A
Document 5: JP 2002-185078 A

The inventions relating to Claims 1 and 2 have neither novelty nor inventive step over the invention disclosed in the document 1. The document 1 discloses a vertical resonator type surface-emitting laser device in which a P type metal electrode is shaped in a rectangle, and a voltage is applied to the P type metal electrode, thereby to increase the carrier density immediately beneath the P type electrode, and decrease the carrier density with distance from the P type electrode.

The inventions relating to Claims 1 and 5 have neither novelty nor inventive step over the invention disclosed in the document 2. The document 2 discloses a vertical resonator type surface-emitting laser device in which plural current blocking layers are laminated to increase a current injection profile in the vicinity of the center of a light emission part.

The inventions relating to Claims 20-24 have neither novelty nor inventive step over the invention disclosed in the document 3. The document 3 discloses a surface type optical amplification element in which plural tonic electrodes are disposed around a disc electrode, and voltages applied to the respective electrodes are individually adjusted to control an injection current distribution, and further, currents injected into the electrodes are modulated to perform an active mode sync operation.

The inventions relating to Claims 8-11, 13, 15-19, and 25 have no inventive step over the inventions disclosed in the documents 1-3.

In the technical field of semiconductor lasers, using a supersaturation absorber, and forming a concave part by etching a portion of a rear surface of a semiconductor substrate are well-known and commonly-used techniques, respectively. Further, setting an oscillation wavelength of laser light is recognized as a term of design that can be arbitrarily performed by those skilled in the art. There is recognized no particular difficulty in fabricating a laser module and a laser projector described in Claims 15-19,

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Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of V-2

using the surface-emitting laser elements described in the documents 1 and 2.

The inventions relating to Claims 6, 7, 12, and 14 have no inventive step over the inventions disclosed in the documents 1, 2, 4, and 5. The document 4 discloses a laser device including an external mirror that is concave in one surface, and a non-linear material inside or outside a resonator. Further, the document 5 discloses a semiconductor laser diode in which, in order to expand emission light, a transparent material that functions as a concave lens is provided in a light emitting part.

Accordingly, it is easy for those skilled in the art to conceive that the both surfaces of the external mirror described in the document 4 are formed in concave shapes to expand the emission light.

The inventions relating to Claims 3 and 4 are not disclosed in any of the documents cited in the International Search Report, and are not obvious to those skilled in the art.